College Avenue

Adaptive Traffic Control Pilot Project

Jan. 11, 2011

Presented by:

Rob Sprinkle
City of Santa Rosa

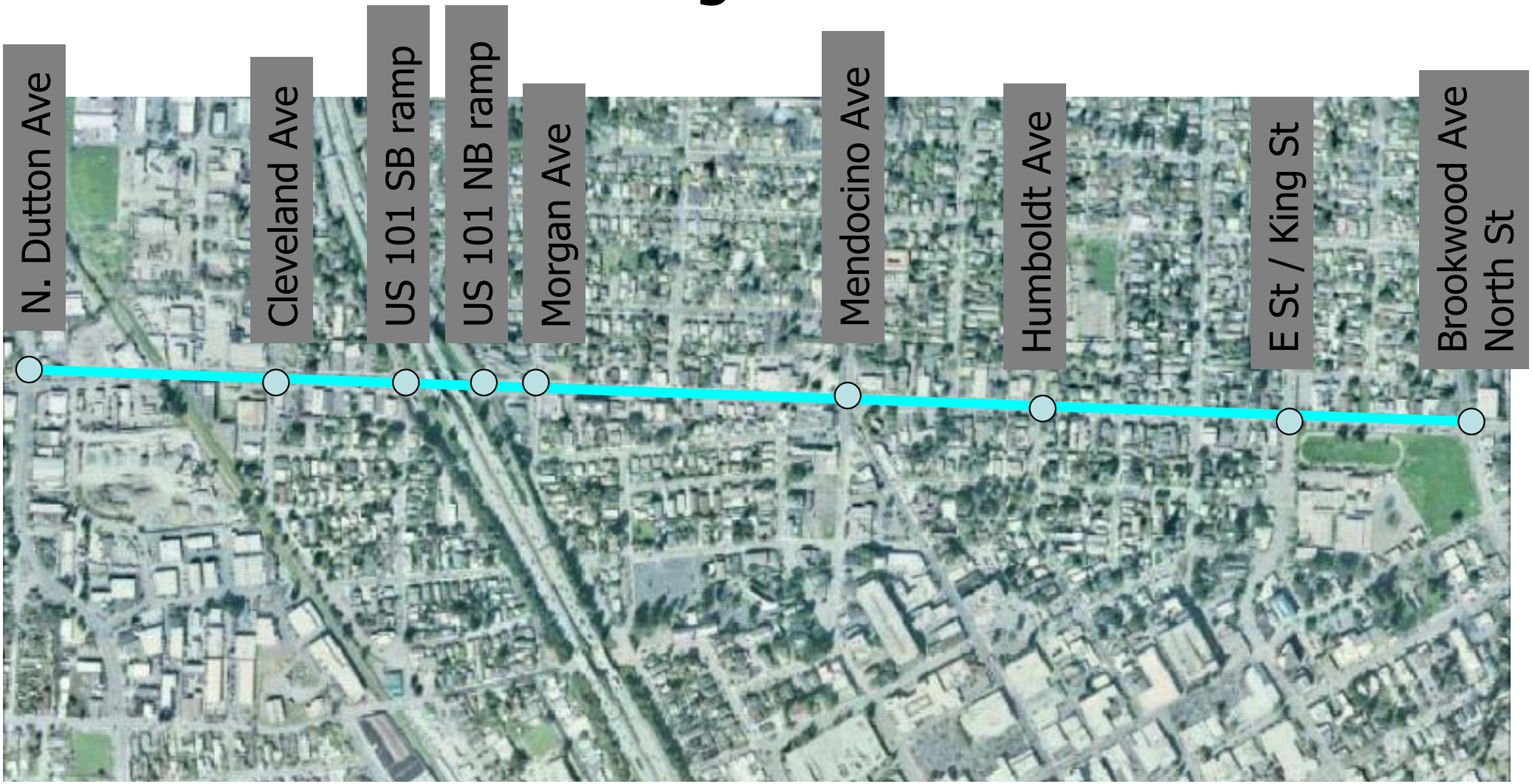
Background

- City of Santa Rosa received a $300,000 Federal Earmark for the installation of an adaptive traffic control pilot project
- The grant required the Systems Engineering process to determine the most appropriate software for the City
- That process identified SCATS as the software best suited for Santa Rosa
- The total project cost was $626,000

Why SCATS?

- Out of the six companies that responded to the request for proposals, only two were true adaptive systems
- SCATS met more of our functional requirements and was most cost effective
- A few companies claimed adaptive, but were really traffic responsive systems

College Avenue



Why College Avenue?

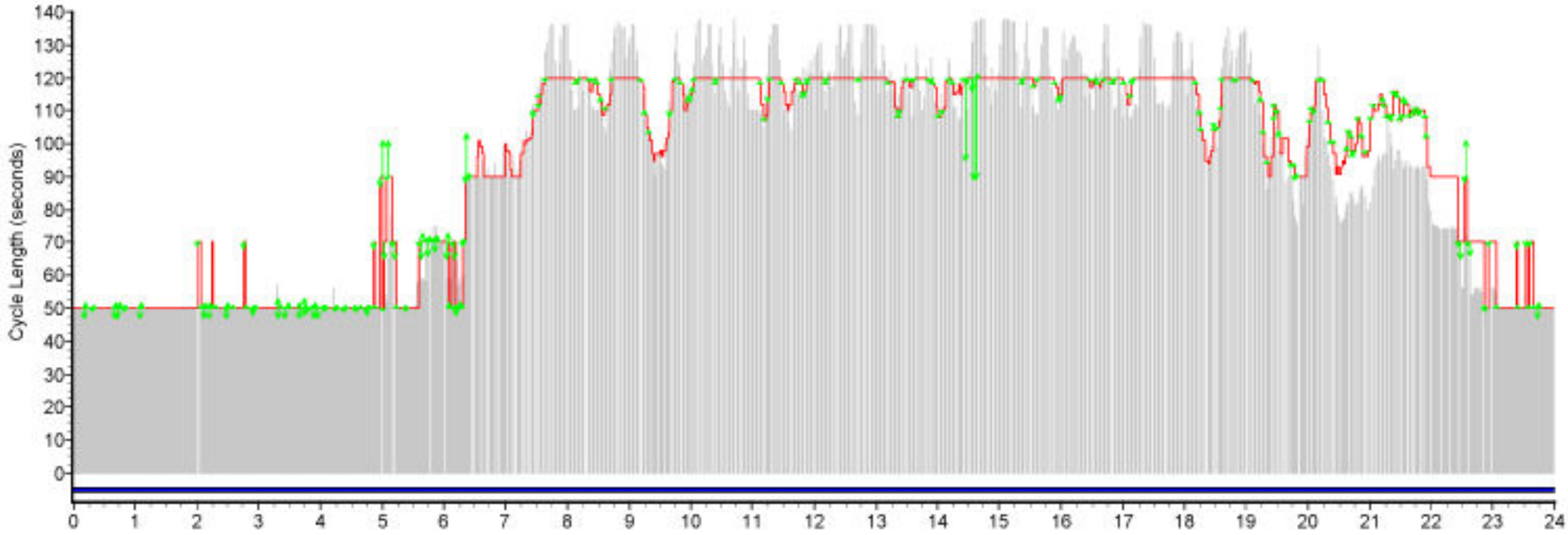
- Dynamic corridor with several traffic generators
  - Santa Rosa High School
  - Santa Rosa Junior College
  - Santa Rosa Middle School
  - US 101 ramps
- College Avenue serves as a local and regional arterial

Old Timing vs. New Timing

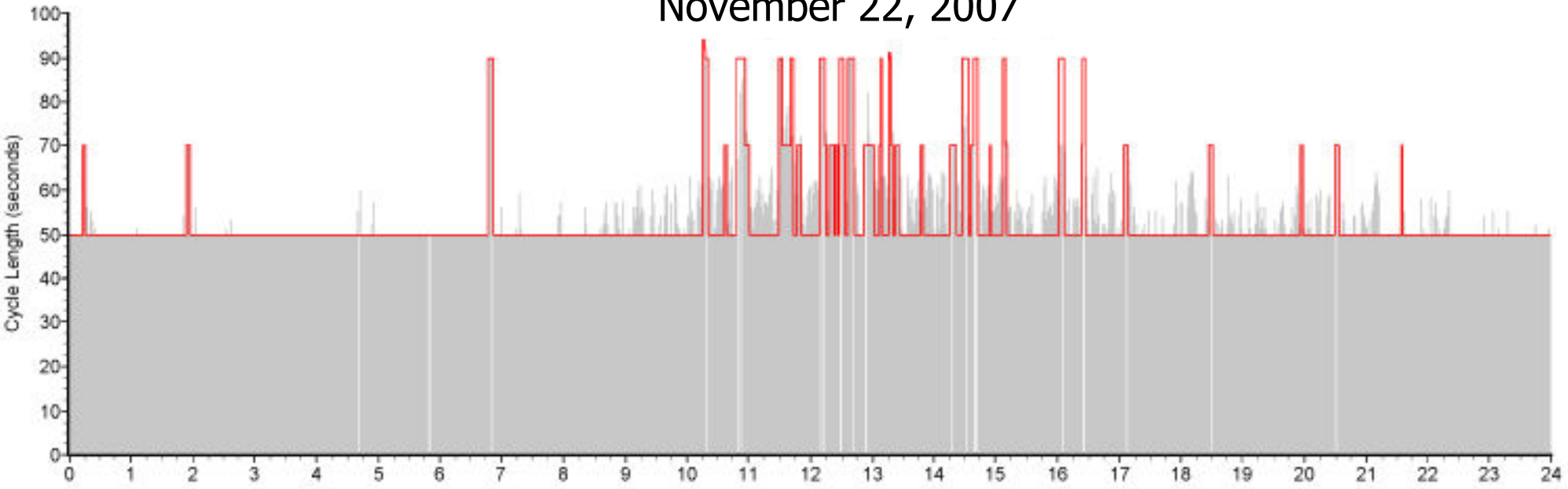
Time of day (TOD) operation (previously in place): Pre-developed timing plans are activated by time of day, based on historic data, and make adjustments due to traffic demand

Traffic Adaptive: Timing splits automatically developed each cycle as traffic demand changes at each intersection and ties groups of intersections together

November 15, 2007

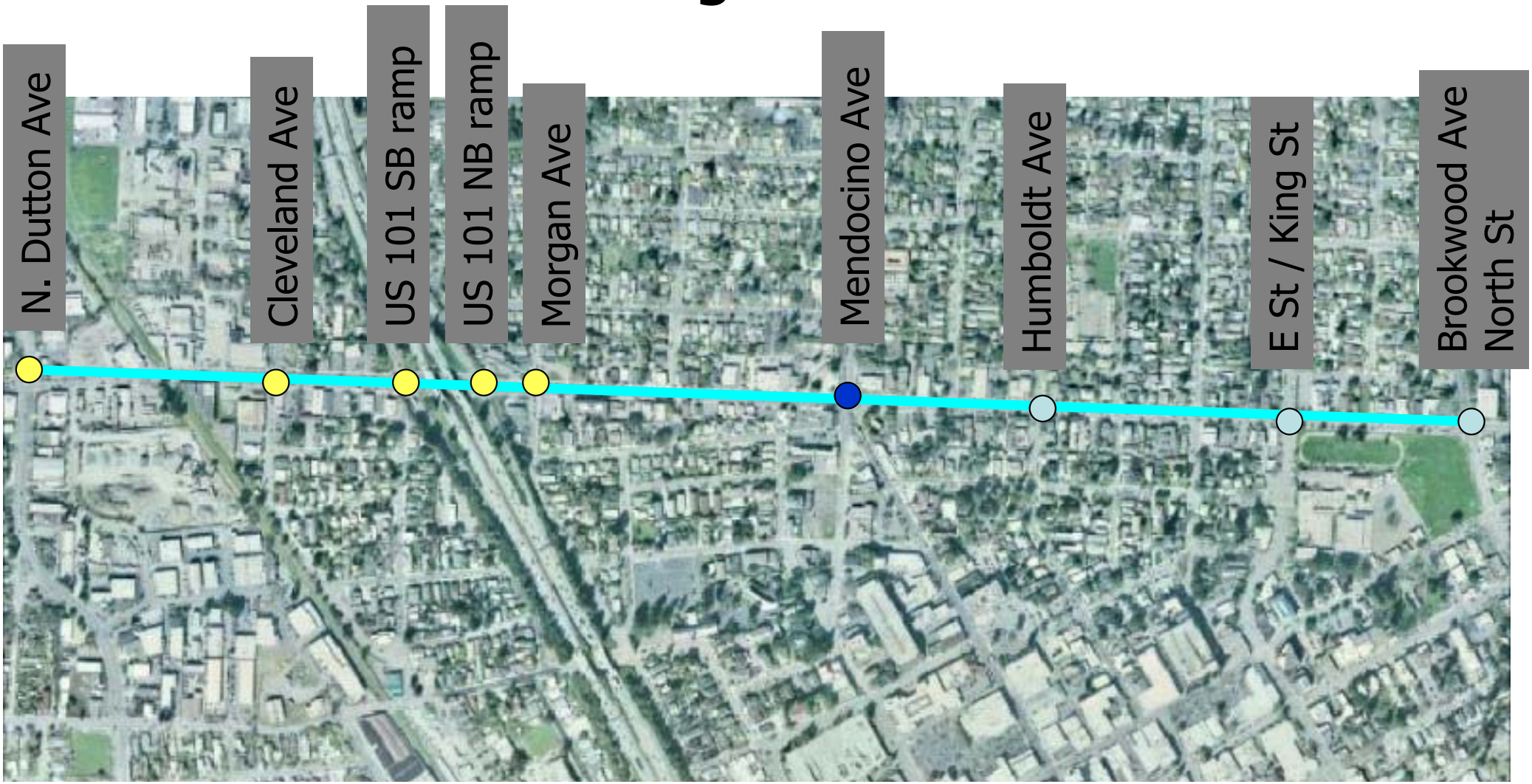


November 22, 2007



Nominal Cycle Length | Required Cycle Length | Link Plan | Split Plan

College Avenue



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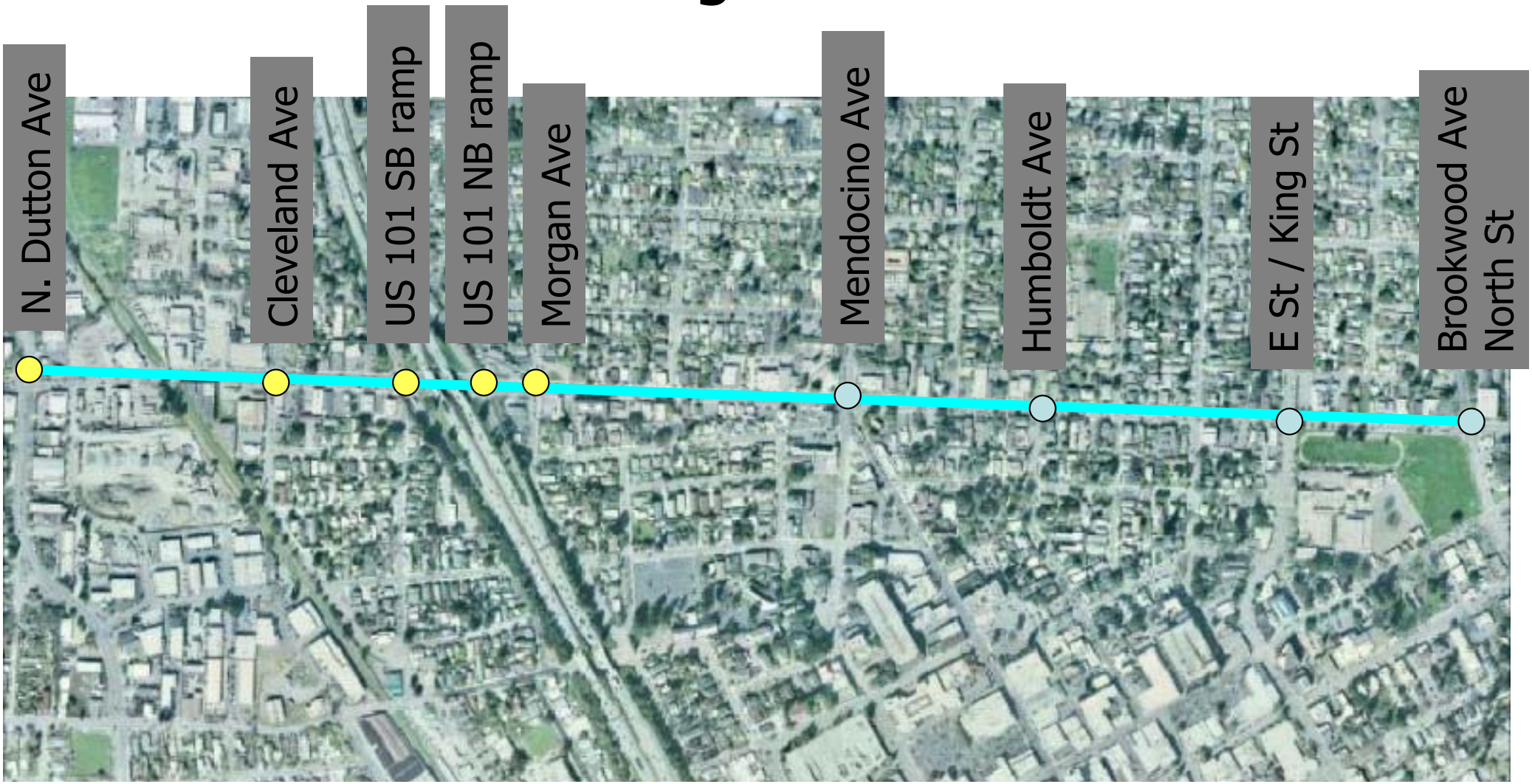

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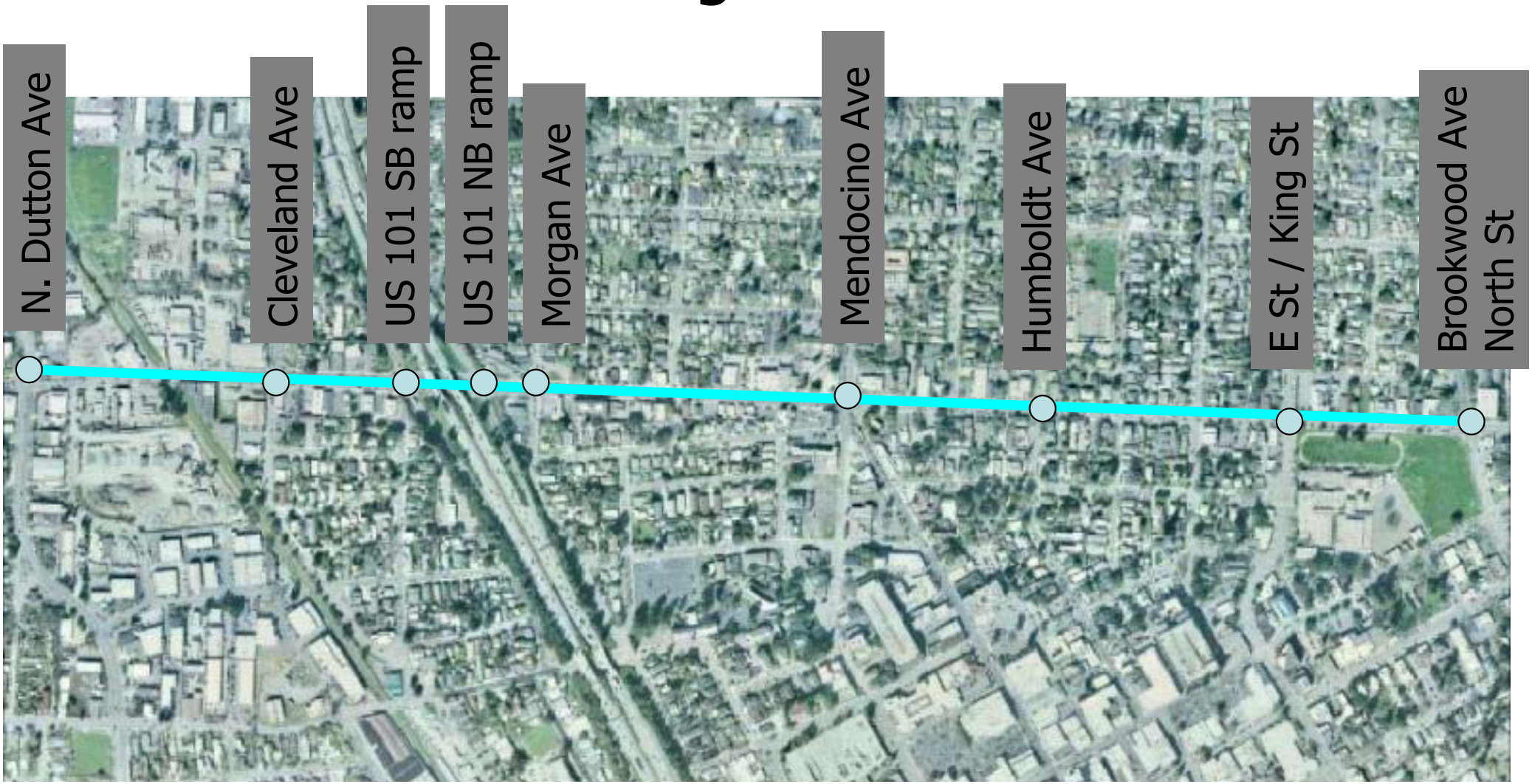

How to test the new system?

- Data was collected with the system running in the adaptive mode for a week
- Data was collected with the system running in time of day plan mode for a week
- During the tests, segment counts were taken to compare each week

The Data

- GPS units were used to collect travel time, speed, and delays throughout the day
- 51 before and 51 after travel time runs were performed
- Manual counts were taken along with hose counts to determine arterial volumes and side street delay was measured at several intersections

Travel Time Data

Corridor – Direction	Period	Peak Volume	Travel Time Before (sec)	Travel Time After (sec)	Weighted Time Savings
College EB	6:00-7:20	731	205	216	-5%
	7:20-9:10	1449	322	259	20%
	9:10-11:45	1901	237	197	17%
	11:45-14:45	2411	224	265	-19%
	14:45-18:00	3043	247	240	3%
	18:00-19:00	594	295	182	38%
	19:00-20:30	672	262	181	31%
College WB	6:00-7:20	616	225	189	16%
	7:20-9:10	1223	487	169	65%
	9:10-11:45	1756	264	199	25%
	11:45-14:45	2168	618	255	59%
	14:45-18:00	2655	550	276	50%
	18:00-19:00	525	220	226	-3%
	19:00-20:30	713	328	199	39%

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Number of Stops

Corridor – Direction	Period	Average # Stops **Before**	Average # Stops **After**
College EB	6:00-7:20	3	3.5
	7:20-9:10	3.5	3
	9:10-11:45	4.5	2.5
	11:45-14:45	4.5	2
	14:45-18:00	4	3
	18:00-19:00	5.5	2
	19:00-20:30	5	2
College WB	6:00-7:20	3.5	4
	7:20-9:10	4	4
	9:10-11:45	4	2.5
	11:45-14:45	11	3.5
	14:45-18:00	12	2.5
	18:00-19:00	2	3
	19:00-20:30	5.5	1.5

Side Street Delay

- Side street delay on several streets did increase
- Across the system, there was a 26% increase delay in side street traffic
- It makes sense – since the cycle is longer on College Avenue, side streets may wait
- We have “half cycled” Humboldt Avenue and King Street to address delay there.

Community Benefit

- It should take between 3-5 minutes to travel College Avenue rather than 4-10 minutes
- The number of stops should decrease from 5 to 3 or less
- Side street delay may increase, but you should have a place to go when you turn onto College Avenue from side streets

Result Summary

- Average Travel Time decreased by 33%
- Number of Stops decreased by 49%
- Side street delay increased by 26%

Essentials

- Reliable communications
  - We use Ethernet over copper
- Reliable detection
  - We use a mainly Autoscope video
  - Some loops (15’ head loops)
  - Some Sensys locations
- We use 2070’s although system is compatible with certain 170E controls

We Like…

- Double service per cycle
- Half cycle feature
- Signals systems marry/divorce depending on counts or cycle times
- Continuous cycle length adjustment and split adjustment
- Low maintenance

We need…

- To become more familiar with details of the software
- To become more confident in making adjustments
- IT support and signal technicians with IT experience

(1) 80 - Sebastopol Rd, Stony Point Rd : Santa Rosa (3) - SR1

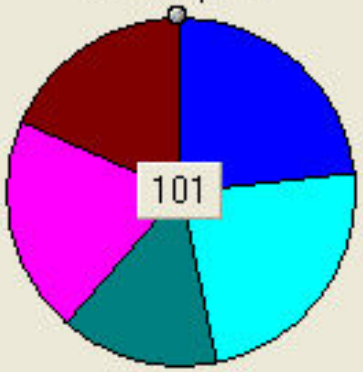
Show Configure Options

Find | Monitor | Subsystem | Strategic Monitor

80	Alarms SI NF	SR1 Subsystem 33	Degree of saturation 96	SCATS 6
Split plan 1	Masterlink	System plan 1	Married +	Cycle generator 59
Offset plan 3	Offset 0, 0 ^B	Link plan 3	Link 0, 0 ^B 108	Active link 0 ^B 108
Special facilities Z- Z3,6		Cycle plan none	Cycle time 101	Required cycle time 95
XSF				

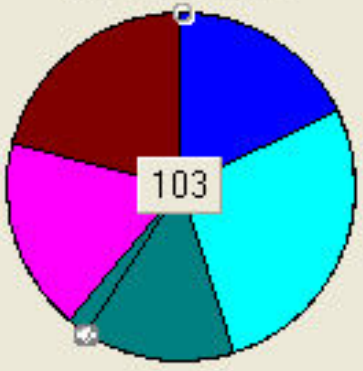
Active plan

<A>	24%	24
E	15%	15
F		
C	20%	21
D	18%	19
B	23%	24

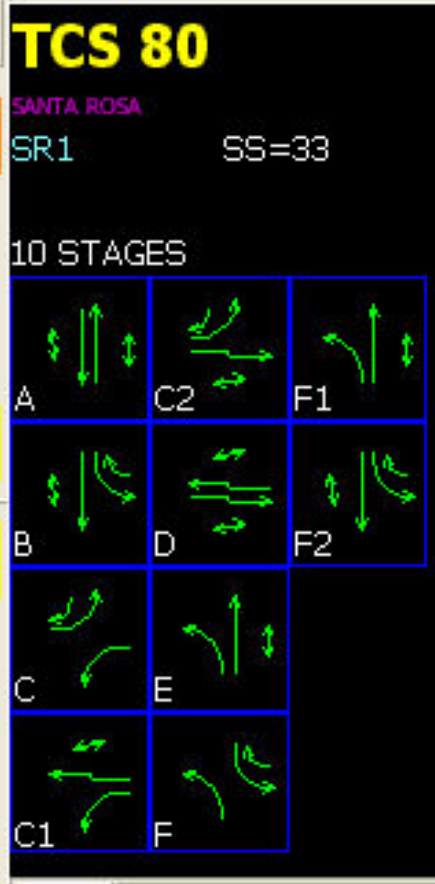


Site operation

<A>	28	0
E	14	1
F		
C	18	1
D	21	0
B	19	0



Active offset 0 ^B	Site Fallback 0
MSS	Masterlink



YEL E RT:@10 MX@11 P^C@12

Additional Projects

- Guerneville/Steele corridor – 11 signal system
  - 35% decrease in travel time during peak
- Stony Point Road – 16 signal system
  - 5% decrease in travel time during peak
- Mendocino Avenue – 10 signal system
  - Under construction